What is claimed is:

1. A method for communicating supplemental data within an optical communications network transmitting a digital payload data stream having a clock signal, the method comprising the steps of:

(i) generating a data sub-channel comprising a supplemental data stream; and

(ii) attaching the sub-channel to the digital payload data stream at an upstream site forming a phase-modulated payload data stream.

2. The method according to claim 1, further comprising the steps of:

(i) recovering the phase-modulated payload data stream;

(ii) retiming the payload data stream using the recovered clock signal; and

(iii) extracting the supplemental data stream from the recovered phase-modulated payload data stream.

3. The method according to claim 1, wherein generating the sub-channel comprises:

(i) driving the phase of a phase-modulator using the supplemental data stream to form a phase-modulated sub-channel; and

(ii) phase-modulating the clock signal contained in the payload data stream using the phase-modulator.

4. The method according to claim 1, wherein attaching the sub-channel to the digital payload data stream at an upstream site comprises re-timing the payload data stream using the phase-modulated clock signal forming a phase-modulated payload data stream.

5. The method according to claim 2, wherein the extracting of the supplemental data in the phase-modulated payload data stream at a downstream site comprises:

(i) extracting the supplemental data stream using a clock and data recovery circuit having a phase-locking oscillation circuit; and

(ii) retiming the payload data stream using the recovered clock signal.

6. The method according to claim 3, further comprising encoding the supplemental data stream prior to phase-modulating the clock signal.

7. The method according to claim 2, further comprising decoding the extracted supplemental data stream.

8. A method for communicating supplemental data within an optical communications network transmitting a digital payload data stream having a clock signal, the method comprising:

(i) modulating the phase of a payload data stream; and

(ii) superimposing a supplemental data stream onto the phase-modulated payload data stream.

9. The method according to claim 8, further comprising:

(i) recovering a phase-modulated payload data stream; and

(ii) demodulating a supplemental data stream from the recovered phase-modulated payload data stream.

10. The method according to claim 8, further comprising encoding the supplemental data stream prior to superimposition.

11. The method according to claim 9, further comprising decoding the demodulated supplemental data stream.

12. An apparatus for transmitting supplemental data within an optical communications network transmitting a digital payload data stream having a clock signal, the apparatus comprising:

means for generating a data sub-channel comprising a supplemental data stream; and

means for attaching the sub-channel to the digital payload data stream at an upstream site forming a phase-modulated payload data stream.

13. The apparatus according to claim 12, wherein the means for generating the sub-channel comprises:

means for driving the phase of a phase-modulator using the supplemental data stream to form a phase-modulated sub-channel; and

means for phase-modulating the clock signal contained in the payload data stream using the phase-modulator.

14. The apparatus according to claim 12, wherein the means for attaching the sub-channel to the digital payload data stream at an upstream site comprises means for re-timing the payload data stream using the phase-modulated clock signal so as to transmit a phase-modulated payload data stream.

15. The apparatus according to claim 13, further comprising means for encoding the supplemental data stream prior to phase-modulating the clock signal.

16. An apparatus for receiving supplemental data within an optical communications network transmitting a digital payload data stream having a clock signal, the apparatus comprising:

means for recovering the phase-modulated payload data stream;

means for retiming the payload data stream using the recovered clock signal; and

means for extracting the supplemental data stream from the recovered phase-modulated payload data stream.

17. The apparatus according to claim 16, wherein the means for extracting the supplemental data from the recovered phase-modulated payload data stream at a downstream site comprises:

means for extracting the supplemental data stream using a clock and data recovery circuit having a phase-locking oscillation circuit; and

means for retiming the payload data stream using the recovered clock signal.

18. The apparatus according to claim 16, further comprising means for decoding the extracted supplemental data stream.

19. An apparatus for transmitting supplemental data within an optical communications network transmitting a digital payload data stream having a clock signal, the apparatus comprising:

means for modulating the phase of a payload data stream; and

means for superimposing a supplemental data stream onto the phase-modulated payload data stream.

20. The apparatus according to claim 19, further comprising means for encoding the supplemental data stream prior to superimposition.

21. An apparatus for receiving supplemental data within an optical communications network transmitting a digital payload data stream having a clock signal, the apparatus comprising:

means for recovering a phase-modulated payload data stream; and

means for demodulating the supplemental data stream from the recovered phase-modulated payload data stream.

22. The apparatus according to claim 21, further comprising means for decoding the demodulated supplemental data stream.

23. An apparatus for transmitting supplemental data within an optical communications network transmitting a digital payload data stream having a clock signal, the apparatus comprising:

a phase-modulator driven by a supplemental data stream for phase-modulating the clock signal of the digital payload data stream whereby a phase-modulated sub-channel is generated; and

a data re-time circuit for re-timing the payload data stream using the phase-modulated clock signal so as to form a phase-modulated payload data stream.

24. The apparatus according to claim 23, further comprising encoder for encoding the supplemental data stream prior to phase-modulating the clock signal.

25. An apparatus for receiving supplemental data within an optical communications network transmitting a digital payload data stream having a clock signal, the apparatus comprising:

a receiver for recovering a phase-modulated payload data stream at a downstream site;

a data re-time circuit for re-timing the payload data stream using the recovered clock signal; and

a phase de-modulator for demodulating the supplemental data stream from the recovered phase-modulated payload data stream.

26. The apparatus according to claim 25, further comprising a decoder to decode the demodulated supplemental data stream.

27. An apparatus for receiving supplemental data within an optical communications network transmitting a digital payload data stream having a clock signal, the apparatus comprising:

a clock and data recovery circuit having a phase-locking oscillation circuit for extracting the supplemental data stream; and

a data re-time circuit for re-timing the payload data stream using the recovered clock signal.

28. The apparatus according to claim 27, further comprising a decoder to decode the extracted supplemental data stream.

29. An apparatus for transmitting supplemental data within an optical communications network transmitting a digital payload data stream having a clock signal, the apparatus comprising:

a phase-modulator for modulating the phase of a payload data stream; and

a transmitter for superimposing a supplemental data stream onto the phase-modulated payload data stream.

30. The apparatus according to claim 29, further comprising an encoder for encoding the supplemental data stream prior to superimposition.

31. An apparatus for receiving supplemental data within an optical communications network transmitting a digital payload data stream having a clock signal, the apparatus comprising:

a receiver for recovering a phase-modulated payload data stream; and

a demodulator for demodulating a supplementary data stream from the recovered phase-modulated payload data stream.

32. The apparatus according to claim 31, further comprising a decoder to decode the demodulated supplemental data stream.